

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

To:

see form PCT/ISA/220

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/JP2005/004735

International filing date (day/month/year)
10.03.2005

Priority date (day/month/year)
11.03.2004

International Patent Classification (IPC) or both national classification and IPC
F02D41/02, F01N3/025

Applicant
TOYOTA JIDOSHA KABUSHIKI KAISHA

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☒ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/JP2005/004735

Box No. I Basis of the opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

Box No. II Priority

1. ☒ The validity of the priority claim has not been considered because the International Searching Authority does not have in its possession a copy of the earlier application whose priority has been claimed or, where required, a translation of that earlier application. This opinion has nevertheless been established on the assumption that the relevant date (Rules 43bis.1 and 64.1) is the claimed priority date.
2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43bis.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.
3. Additional observations, if necessary:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
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**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or
Industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes: Claims	2-6,
	No: Claims	1, 7-11
Inventive step (IS)	Yes: Claims	
	No: Claims	1-11
Industrial applicability (IA)	Yes: Claims	1-11
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VI Certain documents cited

1. Certain published documents (Rules 43bis.1 and 70.10)
and /or
2. Non-written disclosures (Rules 43bis.1 and 70.9)
see form 210

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1 Reference is made to the following documents:

- D1: US-A-4 509 327 (ENGA ET AL) 9 April 1985
- D2: WO 02/38932 A (ROBERT BOSCH GMBH; SCHALLER, JOHANNES; WEBER, GEORG; HARNDORF, HORST;) 16 May 2002
- D3: EP-A-1 394 373 (AUDI AG) 3 March 2004
- D4: PATENT ABSTRACTS OF JAPAN vol. 2002, no. 12, 12 December 2002 (2002-12-12) & JP 2002 227688 A (NISSAN MOTOR CO LTD), 14 August 2002
- D5: PATENT ABSTRACTS OF JAPAN vol. 2003, no. 05, 12 May 2003 (2003-05-12) & JP 2003 020930 A (TOYOTA MOTOR CORP), 24 January 2003

2 Lack of Clarity

The application does not meet the requirements of Article 6 PCT, because claims 1,2 and 8 are not clear.

The definition of the "burn-up heating" is not clear. The examiner has understood from the description (see page 11) that **during the burn-up heating** a period in which the air-fuel ratio becomes equal to or slightly lower than the stoichiometric air-fuel ratio due to the intermittent fuel addition and a period in which no fuel is added are alternately repeated. This concept is not sufficiently represented in the wording of the claims ("intermittently decreasing the air-fuel ratio") because a filter regeneration with a rich air-fuel ratio between the normal (lean) driving periods would also be covered by the wording of the claims.

Furthermore, Claim 8 is not supported by the description as required by Article 6 PCT, as its scope is broader than justified by the description and drawings. The reasons therefor are the following:

While the description (as well as independent claims 1 and 2) is referring to the inactivity of the catalyst there is no feature in claim 8 which determines the catalyst inactivity. The broader wording of claim 8 ("prohibiting ... based on the detected temperature") also covers the possibility that the burn-up is prohibited because the temperature is exceeding an upper threshold in order to protect the exhaust purification apparatus against thermal

deterioration.

3 Lack of Novelty and/or Inventive step

3.1 Independent Claims 1 and 8

Furthermore, the above-mentioned lack of clarity notwithstanding, the subject-matter of claims 1 and 8 is not new in the sense of Article 33(2) PCT, and therefore the criteria of Article 33(1) PCT are not met.

The document D1 discloses (the references in parentheses applying to this document):
A regeneration controller for eliminating particulate matter accumulated in an exhaust purification apparatus, the regeneration controller comprising:
a heating section for heating the exhaust purification apparatus and eliminating the particulate matter accumulated in the exhaust purification apparatus when an estimated accumulation amount is greater than a reference accumulation amount (this is determined by comparing the detected backpressure with a threshold B, see comparator in Fig. 5);
a temperature detector (60) for detecting temperature of the exhaust gas purification apparatus;
a control section for intermittently decreasing the air-fuel ratio of the exhaust to heat the exhaust purification apparatus and perform burn-up heating for burning the particulate matter (see col. 2, lines 39-54);
a prohibition section for prohibiting burn-up heating when a temperature detected by the temperature detector decreases to a catalyst inactivation level (the burn-up is only executed if filter temperatures are above 250 °C, see col. 8 lines 38-45).

Claim 1 is therefore not new. The same reasoning applies, mutatis mutandis, to the subject-matter of the (more general) independent method claim 8 which therefore is also considered not new.

3.2 Independent claim 2

Claim 2 differs from claim 1 in that in order to determine the catalyst inactivity the temperature is monitored for a prohibition determination reference period. This however cannot be considered as inventive as it is well known to use such a time period in order to reduce the impact of noise in the signal detection.

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The subject-matter of claim 2 is therefore not inventive in the sense of Article 33(3) PCT.

3.3 Dependent claims

Dependent claims 3-7 and 9-11 do not appear to contain any features which meet the requirements of the PCT in respect of novelty and/or inventive step, see documents D1-D5 and the corresponding passages cited in the search report.

Re Item VI

Certain documents cited

In accordance with Rule 70.10 PCT reference is made to DE 10 2004 015545 A1, which was published on 11 November 2004, but claims an earlier priority date (31 March 2003).

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